

6. Find the union and intersection of $E = \{1, 2, 4, 8, 16, 32\}$ and $F = \{1, 4, 16, 64\}$.

Applications

Solve.

7. **Rolling a Die:** Consider rolling a fair 6-sided die. The set of all possible outcomes is $S = \{1, 2, 3, 4, 5, 6\}$. Since there are 6 outcomes for rolling the die and each outcome has an equal chance of occurring, the probability of rolling a specific outcome is $\frac{1}{6}$. Let E be the set of odd outcomes and let F be the set of outcomes greater than three. $E = \{1, 3, 5\}$ and $F = \{4, 5, 6\}$.

a. What is the probability of rolling an outcome in $(E \cup F)$?

b. What is the probability of rolling an outcome in $(E \cap F)$?

8. **Biology:** In a biology lab, vials considered defective must be thrown away. The following chart shows the breakdown of vials in a testing center by distributor.

Lab Vials by Distributor

Lab Vials	BioVial	L.B.C.
Usable	1762	2001
Defective	3	2

- a. If a random vial is chosen from the biology lab, what is the probability that the vial is usable?
- b. Find the probability that two lab partners both randomly choose a defective vial, one after another, if all the vials are stored together.